

## ABSTRACT

### A VARIABLE STABILITY TEST VEHICLE FOR ITS APPLICATIONS

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A variable stability test bed is under development for the National Highway Traffic Safety Administration. The Variable Dynamic Testbed Vehicle (VDTV) is being designed for research and testing of advanced collision warning and avoidance technologies being developed by industry and most likely being available to consumers in the near future. The VDTV will also be used by NHTSA in support of the Automated Highway System (AHS) Program and possibly by the ATIS program directly.

The VDTV will have advanced dynamic control systems that can be varied by an on-board programmable computer. Suspension, steering, throttle, anti braking will thus be controlled through selected algorithms that may be changed to provide a reasonably broad range of vehicle dynamic characteristics. The vehicle is inherently a drive-by-wire system, is instrumented for both vehicle and human factor measurements, and is therefore ideally suited to many Intelligent Transportation Systems applications.

This paper will describe the intended uses of the VDTV and the vehicle's specifications that were developed by the Jet Propulsion Laboratory. It will also describe the results of dynamic analyses that were conducted by JPL prior to award of a system contract to industry\* for the detailed design and construction of the vehicle. The analysis shows the dynamic emulation capabilities of the VDTV as well as expected dynamic performance in limit performance situations that would be encountered in severe crash avoidance maneuvers.

\* JPL expects to award a contract for this vehicle in the May-June 1996 time-frame.